

REMARKS

Applicant requests favorable reconsideration and allowance of the subject application in view of the preceding amendments and the following remarks.

Claims 19-24 are presented for consideration. Claims 19, 22 and 23 are independent. Claims 19, 22 and 23 have been added to clarify features of the subject invention. Support for these changes can be found in the original application, as filed. Therefore, no new matter has been added.

Applicant requests favorable reconsideration and withdrawal of the rejection set forth in the above-noted Office Action.

Claims 19-24 were rejected under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 5,841,250 to Taniguchi. Applicant submits that the cited art does not teach many features of the present invention, as previously recited in claims 19-24. Therefore, this rejection is respectfully traversed. Nevertheless, Applicant submits that independent claims 19, 22 and 23, for example, as presented, amplify the distinctions between the present invention and the cited art.

In one aspect of the invention, independent claim 19 recites a scan type exposure apparatus including a first stage on which a first object is placed, a second stage on which a second object is placed, and a projection optical system for projecting a pattern of the first object onto the second object. The apparatus further includes a scanning mechanism and a signal system. The scanning mechanism is arranged to scanningly move the first and second stages in a timed relation with each other, relative to the projection optical system, while the pattern of the

first object is projected by the projection optical system onto the second object. The signal system is systemized to store data corresponding to a change in an exposure condition, the change in the exposure condition is produced in response to scan motion of at least one of the first and second stages and in accordance with one of scan acceleration and scan speed, and the data is measured beforehand by obtaining data of a projected image of the pattern of the first object, being formed on the second object through the projection optical system, while scanningly moving at least one of the first and second stages. The signal system is further systemized to control a drive of the first and second stages in an actual exposure process so as to compensate for a change in the exposure condition, while reflecting a correction value, as determined on the basis of the data stored, to the driving of at least one of the first and second stages.

In another aspect of the invention, independent claim 22 recites a device manufacturing method including a pattern exposure step for performing exposure by use of a scan type exposure apparatus including (i) a first stage on which a first object is placed, (ii) a second stage on which a second object is placed, (iii) a projection optical system for projecting a pattern of the first object onto the second object, (iv) a scanning mechanism arranged to scanningly move the first and second stages in a timed relation with each other, relative to the projection optical system, while the pattern of the first object is projected by the projection optical system onto the second object, and (v) a signal system systemized to store data corresponding to a change in an exposure condition. The change in the exposure condition is produced in response to scan motion of at least one of the first and second stages and in accordance with one of scan acceleration and scan

speed, and the data is measured beforehand by obtaining data of a projected image of the pattern of the first object, being formed on the second object through the projection optical system, while scanningly moving at least one of the first and second stages. The signal system is further systemized to control drive of the first and second stages in an actual exposure process so as to compensate for a change in the exposure condition, while reflecting a correction value, as determined on the basis of the data stored, to the driving of at least one of the first and second stages. The method further includes a development step for developing the second object pattern exposed by the scan type exposure apparatus. A circuit pattern can be formed on the basis of the developed exposed pattern.

In still another aspect of the invention, independent claim 23 recites a scan type exposure apparatus including a first stage on which a first object is placed, a second stage on which a second object is placed, and a projection optical system for projecting a pattern of the first object onto to the second object. The apparatus further includes a scanning mechanism, storing means and drive control means. The scanning mechanism is arranged to scanningly move the first and second stages in a timed relation with each other, relative to the projection optical system, while the pattern of the first object is projected by the projection optical system onto the second object. The storing means stores data related to a shift in a projected image due to vibration of the projection optical system. The drive control means changes a scan speed of at least one of the first and second stages so as to compensate for a change in the exposure condition, on the basis of the stored data.

By such an arrangement, in the present invention, the drive of the first and second stages can be controlled in an actual exposure apparatus so as to compensate for a change in an exposure condition, such as an offset or an offset correction. As discussed in the subject specification, the offset correction can functionally correspond to compensation of a change in an exposure condition, as now recited in independent claims 19, 22 and 23. Applicant submits that the cited art does not teach or suggest such features of the present invention, as recited in those independent claims.

The Taniguchi patent shows measurement of image formation characteristics of a scanning type exposure apparatus. That patent, however, teaches nothing regarding controlling or changing a drive of first and second stages so as to compensate for a change in an exposure condition or in image formation characteristics, in the manner of the present invention recited in the independent claims. Rather, and to the contrary, the Taniguchi patent suggests lowering the scanning velocity by use of a stage controller 14 when a desired accuracy of the image formation characteristics is not obtained. This is discussed in more detail in the Taniguchi patent at column 30, lines 37-41. Generally speaking, in a scanning exposure apparatus, lowering the scanning speed (the scanning velocity) directly leads to a decrease in the throughput. Applicant submits, therefore, that in the Taniguchi patent, the image formation characteristics are maintained at the price of the scanning speed, that is, the throughput.

Applicant submits, however, that in the present invention recited in independent claims 19, 22 and 23, on the other hand, the drive of the first and second stages is controlled to compensate for a change in an exposure condition. As a result, the present invention can achieve

the required precision of the exposure condition without lowering the scanning speed. In more detail, in accordance with the present invention, the required precision of the exposure condition can be satisfied without a decrease in the throughput.

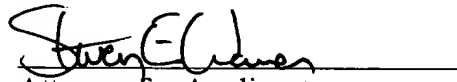
For the reasons noted above, Applicant submits that the Taniguchi patent does not teach or suggest the salient features of Applicant's present as recited in independent claims 19, 22 and 23. For these reasons, Applicant submits that the present invention, as recited in independent claims 19, 22 and 23, is patentably defined over the cited art.

Dependent claims 20, 21 and 24 also should be deemed allowable, in their own right, for defining other patentable features of the present invention in addition to those recited in their respective independent claims. Further individual consideration of these dependent claims is requested.

Applicant further submits that the instant application is in condition for allowance. Favorable reconsideration, withdrawal of the rejections set forth in the above-noted Office Action and an early Notice of Allowance are requested.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should be directed to our address listed below.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Steven E. Warner", is written over a horizontal line.

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